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Tungsten	Chelius & Schussler	M 2/17	85	(0.7)
Precious Metals	Chelius & Schussler	M 2/17	86	(0.6)
	Bard	M 2/17	86	(0.8)

53, 54. Plastics, Rubber & Elastomer

Plastic Bearings	Walton	7/13	119	(4.0)
The Cost of Fastening Plastics	Spro	7/27	72	(6.0)
Europe's Plastic Housing Boom	Article	10/5	34	(3.0)
Plastic Plated With Gold to Reduce Finishing Cost	NT	12/14	9	(0.5)
Rebirth of the Plastic Car?	Bryson	12/14	22	(5.0)
Plastic Chair Molded in One Piece	NT	2/10	25	(0.5)
Plastic Housing Resists Steam, Impact	Scan	2/10	116	(0.5)
Flame-Retardant Structural Foam Bids For Many Of Metals' Jobs	NT	4/6	8	(0.3)

The Cost of Plastic Parts	Wroten	5/18	123	(3.0)
Sandwich Molding of Plastics	Ogorzewicz	6/29	68	(4.0)
Thermoplastic-Type Elastomers	Wells	12/28	52	(10.0)
Injection-Molded Thermoset Parts	Bodner & Valli	2/10	98	(6.0)
Cold-Runner Design Cuts Cost In Thermoset Molding	NT	4/6	10	(0.5)
Isolating Vibration	Erhart & Salerno	7/27	92	(5.0)
Elastomers at Low Temperatures	Sarbach	9/21	128	(5.0)
Materials for Bonded-Rubber Parts	Reid	12/14	144	(5.0)
Thermoplastic-Type Elastomers	Wells	12/28	52	(10.0)

55, 56. Joining Materials, Other Nonmetals

Heat-Resistant Adhesives	Bryson	6/15	124	(5.0)
The Cost of Fastening Plastics	Spro	7/27	72	(6.0)
For High Temperatures: Carbon Deposited On Carbon Composites	NT	3/9	18	(0.7)
'Ceramics Will Replace Superalloys In Turbines'	NT	1/13	26	(0.5)
Glass-Nosed Sub To Start Sea Trials	NT	2/10	8	(0.8)
Command-Break Glass Protects Missile's Eye	NT	4/20	10	(0.6)
Fiber Glass Called Key to Expanding Radial-Tire Market	NT	9/7	18	(1.0)
Bottles Recycled, New Sewer Pipe Results	NT	11/30	8	(0.7)
Fundamentals: Insulation and Temperature Rise	Beebe	B 4/13	5	(2.0)
Coatings That Fight Fire and Heat	Lavoie	7/27	87	(5.0)
Lead/Foam Composite Stops Noise	Scan	11/16	146	(0.5)
Microspheres Identify Product, Tell Its Age	NT	3/9	8	(0.5)
Friction Materials	Jensen	1/27	108	(6.0)

57. Finishes, Coatings, Lubricants

Black Tin Oxide Gets Industrial Role	NT	1/27	10	(0.7)
Do You Really Understand Surface Texture?	Khol	4/6	86	(6.0)
New Additives Boost Performance Of Silicone Lubes	NT	4/20	8	(0.8)
Lubricants: Oils and Greases	Rollins	B 6/22	150	(2.0)
Lubricants: Solid and Bonded-Film Lubricants	DiSapio	B 6/22	152	(3.0)
Lubricant Leaching Solved for P/M Bearings	NT	10/5	10	(0.7)

58. Prefabricated Forms

Finished Metals	Chapter	M 2/17	175	(1.0)
Layering Porous Metal Improves Its Properties	NT	12/28	10	(0.6)
Lead/Foam Composite Stops Noise	Scan	11/16	146	(0.5)
Flame-Retardant Structural Foam Bids For Many Of Metals' Jobs	NT	4/6	8	(0.8)
Foam Is the Structure in Prototype Furniture	NT	9/7	12	(0.7)
Applications Sought for Extruded Foams	NT	10/19	10	(0.7)
Flex Tubing Puts Eyes in the Hawk	Scan	9/21	152	(1.0)
Europe's Plastic Housing Boom	Article	10/5	34	(3.0)

MANUFACTURING PROCESSES

61-63. Metals Casting, Shaping, Forming

Casting Processes	Wallace	M 2/17	92	(2.5)
Aluminum Casting Alloys	Rowe, King & Blackmum	M 2/17	94	(1.7)
Cast Copper Alloys	Strubell	M 2/17	96	(0.9)
Designing for Cast-Weld Fabrication	Wallace	5/4	94	(6.0)
What's Happening in Centrifugal Casting?	Bryson	10/19	154	(5.0)
What's With Ferrous Die Casting?	Khol	11/2	92	(4.0)
Casting's Texture Etched Into Die	NT	12/28	8	(0.5)
Forging	Burbank	M 2/17	97	(1.8)
Nonferrous Metals	Merrill	M 2/17	99	(1.3)
Ferrous Metals	Barrett	M 2/17	100	(0.5)
Cold Extruding	Shiller & Isbit	M 2/17	136	(1.3)
Riveting Machine Forms Heads Quietly	NT	1/13	26	(0.5)
Cold Heading	Havils & Zanin	M 2/17	137	(0.7)
Powder Metallurgy	Wielh	M 2/17	147	(2.0)
New Muscle for P/M Sprockets	Badger	2/24	84	(3.0)
P/M Parts	Altmeier	6/29	72	(5.0)
Lubricant Leaching Solved for P/M Bearings	NT	10/5	10	(0.7)
Low-Cost Prototype P/M Parts	Anderson	11/16	125	(2.0)
Stamping	Carter	M 2/17	138	(1.0)
Deep Drawing	McClurg	M 2/17	139	(1.0)
Deep Drawability Confirmed for New Steel	NT	2/24	27	(0.6)
Designing Parts for Fine Blanking	Nosenzo	3/23	105	(3.0)
An Identity Crisis for Fine Blanking	Khol	6/29	58	(5.0)
Spinning	Storch	M 2/17	140	(1.0)
Roll Forming	Todoran	M 2/17	141	(1.0)

64, 65. Metal Joining, Removal

Designing for Cast-Weld Fabrication ..	Wallace	5/4	94	(6.0)
The Cost of Fastening Plastics	Sprow	7/27	72	(6.0)
High-Velocity Forming	Zernow	M 2/17	142	(1.9)

Exploding Ribbon Welds Aluminum: Sheet	Scan	10/5	127	(0.5)
Bronze Metallurgically Bonded To Iron	NT	3/9	8	(0.5)
Wet Diffusion Bonding Forms Complex	NT	11/16	6	(1.0)
Part	Reid	12/14	144	(5.0)
Materials for Bonded-Rubber Parts	Olofson	M 2/17	144	(1.3)
Machining	NT	11/2	12	(1.0)
Machining Difficult Materials: New	Kasabian	12/28	68	(5.0)
Tools Multiply Cutting Speeds	NT	1/13	12	(0.7)
High-Speed Machining	Mueller	6/1	83	(5.0)
Metal-Removal Speed Doubled by New	Chapter	M 2/17	145	(1.8)
Insert				
Abrasive Machining				
Chemical and Electrical Machining				

66. Metal Treating

Laser Machining Produces Circuits In	NT	6/1	18	(0.7)
Single-Step Process				

67, 68. Finishing, Plastics & Rubber Processes

New Pretreatment Improves Plating On	NT	1/13	18	(0.6)
Plastics	NT	3/9	22	(0.5)
Unplatable Plastics Plated With Metal	NT	12/14	8	(0.5)
Plastic Plated With Gold To Reduce	Bodner & Vaill	2/10	98	(6.0)
Finishing Cost	NT	4/6	10	(0.5)
Injection-Molded Thermoset Parts	Wroten	5/18	123	(3.0)
Cold-Runner Design Cuts Cost In	Ogorkiewicz	6/29	68	(4.0)
Thermoset Molding	NT	10/19	10	(0.7)
The Cost of Plastic Parts				
Sandwich Molding of Plastic				
Applications Sought for Extruded Foams				

69. General

Promising Future Seen For Industrial-	NT	2/10	10	(0.7)
ized Housing				

DESIGN THEORY & TECHNIQUES

71-73. Mechanics, Strength of Materials and Parts

Natural Frequencies of Beams and	Snowdon	3/23	126	(4.0)
Plates	Erhart & Salerno	7/13	112	(7.0)
Isolating Vibration	Scan	7/13	125	(0.5)
Tandem Transducers Give You Just the	Shapiro & Benes	9/7	99	(6.0)
Facts	Finkelston	10/5	122	(4.0)
Predicting Rotor Response	Bradley	11/30	67	(5.0)
How Much Shake Can Bolted Joints	Chapter	EDE 11/23	166	(0.75)
Take?	Chapter	EDE 11/23	167	(0.3)
Realistic Tolerances for Rotors	NT	5/4	34	(0.6)
Simulation Equipment: Vibration-Testing	Chapter	EDE 11/23	117	(1.1)
Machines	Schremmer	9/21	140	(6.0)
Simulation Equipment: Shock-Testing	Osgood	3/9	104	(4.0)
Machines	Bayer	12/28	73	(4.0)
Quiet Snowmobile Sounds Like A Sports-	Lange	9/7	105	(7.0)
car	McNitt	11/30	62	(5.0)
Fundamental Measurement Equipment:	Trilling	12/14	130	(4.0)
Sound	Kuran	11/16	131	(3.0)
How to Keep Bolted Joints Tight	Snowdon	3/23	126	(4.0)
How Elasticity Influences Bolted-Joint	Baumeister & Sebrosky	10/19	159	(3.0)
Design	Baumeister & Sebrosky	12/28	65	(3.0)
Understanding the Fundamentals of Wear	Snowdon	3/23	126	(4.0)
The Cost of Fracture Control	Baumeister & Sebrosky	10/19	159	(3.0)
Unmasking Hydrogen Embrittlement	Bradley	11/30	67	(5.0)
Fastener Failures Are Expensive				
Dynamic Stress in Helical Springs				
Natural Frequencies of Beams and Plates				
A Fast Technique for Finding Vertical				
Column Deflections				
Deflection and Slope in Tapered Beams..				
Natural Frequencies of Beams and Plates				
A Fast Technique for Finding Vertical				
Column Deflections				
Realistic Tolerances for Rotors				

74. Human-Factors Engineering

Parameters Studied For Device To Keep	NT	4/20	36	(1.2)
Drunks Off The Roads	NT	9/7	10	(0.6)
Space Shuttle To Get 'Homey' Commodes	NT	10/5	8	(0.6)
Tastiest Menu Available to Skylab Crews	NT	11/16	18	(0.7)
Design Car So Driver's Head Need Not	NT	12/14	18	(0.5)
Move	Wise	1/27	20	(6.0)
Remote Health-Care Site To Be Selected				
Bags, Belts, or Both?				

What Ever Happened to the Barrel Stave?	Heumann	2/10	26	(5.0)
Safety Dominates New Toy Designs	Aronson	3/23	32	(4.0)
Design For Safety—Or Else!	Hammer	3/23	108	(8.0)
'Thinking' Seat Chooses Aircraft-Escape	NT	5/4	12	(0.8)
Method	Wise	5/4	20	(8.0)
Carnage In The Courtroom	NT	6/1	10	(0.7)
Stronger Bumpers Needed By Small Cars	NT	6/29	6	(0.7)
Radar Warns Motorist When He Is	NT	6/29	18	(0.5)
Tailgating	Wise	7/13	20	(6.0)
Human Volunteers Show Air Bags Work	Scan	7/13	125	(0.5)
Under Ideal Conditions	NT	10/5	26	(0.8)
Radar Not Ready For Car-Crash Sensing	DI	10/5	42	(0.5)
ESVs—Engineering Overkill Or New Era	Coppa-Zuccari	11/16	28	(2.0)
In Auto Safety?	NT	5/4	18	(0.6)
Broadcast Screen Yells Warning				
Rescue Is Feasible If Skylab Encounters				
Trouble				
BMW's "Safe" Car				
Italian Car Safety				
Man Judged Not Ready For Long Space				
Trips				

75. Design Analysis & Synthesis

Recorder Linearity: Fact or Fantasy? ..	Thompson	4/20	197	(5.0)
Space Shuttle Landings To Be Simulated	NT	4/20	18	(0.5)
In Flight Tests	Aronson	11/30	20	(5.0)
Hydraulic Models: Solving Major Problems	Chapter	EDE 11/23	166	(0.8)
in Miniature	NT	2/10	6	(1.3)
Simulation Equipment: Environmental	Khol	2/24	72	(6.0)
Chambers	NT	4/20	10	(0.6)
Computer Reassured Daredevil Before He	Khol	6/1	68	(6.0)
Spiraled A Car	Chapter	EDE 11/23	97	(0.5)
Super Program Spells Doom for Cut-and-	Chapter	EDE 11/23	98	(0.5)
Try Design	Lavoie	12/14	124	(6.0)
Computer Program Aids Designers				
The Marriage of CAD and CAM				
Computers: Time-Sharing				
Computers: Programming Services				
Computerized NC To Match Your Budget				

76. Basic Sciences & Fields

Limits Set On Faster-Than-Light Particle	NT	2/24	33	(0.7)
Emissions	NT	4/6	28	(0.7)
Rare Hyperons Produced In Quantity ..	NT	11/2	20	(6.0)
Fire-Fighting Technology	Aronson	11/2	103	(5.0)
Holding Dimensions Thermally Stable ..	Gruede			

Simulation Equipment: Environmental Chambers	Chapter	EDE 11/23	166	(0.8)
No Pollution When Coating Is Cured with Ultraviolet	NT	10/5	11	(0.7)
Dog Alive And Well After Seven Days With Artificial Heart	NT	7/27	10	(1.2)
The Electronic Hospital	Bryson	11/16	20	(5.0)
Image Enhancement	Khol	4/20	181	(6.0)
Very High Speed Camera Records Metal Cutting	NT	5/18	36	(0.6)
Troubleshooting with the SEM	Khol	5/18	142	(3.0)
Freezing the Fleeting Malfunction with high-speed photography	Leonard	10/5	107	(5.0)
A Hologram Camera	Scan	11/2	108	(1.0)
Vacuum Cleaner Solves Photography	NT	12/14	6	(0.8)
Ultrasonics To Clean Old-Car Emissions	NT	3/23	6	(0.7)
Magnesium Stub Ups Ultrasonic Efficiency	Scan	4/6	99	(1.0)
Antisymmetrical Wing Proposed For Supersonic Flight	NT	6/15	6	(0.7)

77. Experimental Design

The Great Mousetrap Car Race	Article	1/13	20	(3.0)
Low-Cost Prototype P/M Parts	Anderson	11/16	125	(2.0)
Prototype Shown of Superconducting Generator	NT	11/30	12	(0.5)

78. Environmental Design

Apollo 16: Three Days In Descartes	Article	4/6	20	(5.0)
Space Shuttle Landings To Be Simulated In Flight Tests	NT	4/20	18	(0.5)
Space Shuttle Decisions Reached	NT	4/20	18	(0.5)

DC-3 Helps Plan For Space Shuttle	NT	4/20	26	(0.6)
Man Judged Not Ready For Long Space Trips	NT	5/4	18	(0.6)
Progress Toward Joint US/USSR Manned Space Mission	NT	6/1	30	(0.5)
Space Shuttle to Get 'Homey' Commodities	NT	9/7	10	(0.6)
Rescue Is Feasible If Skylab Encounters Trouble	NT	10/5	26	(0.8)
Skylab: The Real Test of Man in Space	Wise	11/16	32	(5.0)
US/USSR Planners Agree On Joint Manned Space Mission	NT	11/30	18	(0.7)
Pioneer 10 Data Surprises NASA	NT	12/14	12	(0.5)
Will Apollo Pay Off?	Bryson	12/28	20	(4.0)
Student Designers Look at Recycling	Aronson	2/10	20	(3.0)
Ultrasonics To Clean Old-Car Emissions	NT	3/23	6	(0.7)
Future Automotive Emission, Safety Standards: Too Costly? Too Soon?	NT	3/23	29	(1.0)
Smog Laws Are Based On Unrealistic Models	NT	4/6	12	(0.5)
L.A. Chamber of Commerce Opposes California Clean Environment Act	NT	5/4	4	(0.5)
Hooded Rail Car To Complete Pollution Control Of Coke Plants	NT	5/4	8	(0.5)
Rights Offered To Smoke Suppressor	NT	6/1	12	(0.5)
Rocket Technology Borrowed For Efficient Pollution Controller	NT	6/1	24	(0.8)
Tests Begin For Wastes-To-Water Converter	NT	6/29	10	(0.7)
Three Schemes Outlined To Save The Environment	NT	7/27		(1.3)
Variance In Smog Test Results Researched	NT	10/5	18	(0.6)
Exhaust System Passing Toughest Federal Tests	Article	11/2	34	(4.0)

ENGINEERING MANAGEMENT & OPERATION

81. Engineering Department Operations

Made In U.S.A.: Profile of an Invader	Khol	1/27	86	(8.0)
What the Behavior. Scientists Are Up To	Reeser	10/5	96	(6.0)
In 1972: 8% More Money For R&D	NT	1/13	4	(1.0)
Keeping Score In Business	Murdick & Petri	1/13	100	(4.0)
How Much Quality Can You Afford In Fluid Power?	Boulden	2/10	88	(5.0)
The Cost of Plastic Parts	Wroten	3/23	116	(4.0)
Engineer's Primer on Financial Analysis: How to Spot a Company Headed for Trouble		5/18	123	(3.0)
Making Decisions Scientifically	Murdick & Eckhouse	10/19	136	(8.0)
How To Fit In with the Product-Planning Committee	Reeser	6/29	52	(6.0)
Plotting Your Way to a Decision	Bickford	11/16	120	(5.0)
What Good Is Technological Forecasting?	Johnson	11/30	44	(6.0)
Dangers of Heavy-Handed Management	Khol	12/14	114	(7.0)
Work Ethic Not Dead, Just Changing	George	5/18	118	(5.0)
'Scorekeeping' Is the Key to Motivation	NT	12/14	4	(0.7)
How to Get Your Message Across	Skousen	12/14	134	(2.0)
EJC Urges New Government Program To Combat Manpower Waste	D'Aprix	12/28	48	(4.0)
College Was Never Like This	NT	1/13	4	(0.5)
Job Prospects Improve Slightly For New Grads	Lavoie	3/23	98	(7.0)
Putting Engineers Back To Work: A Tough Job	NT	4/6	4	(0.5)
Coming: Another So-Called Engineer Shortage	NT	6/1	4	(1.0)
Demand For Executives Remains Level	NT	10/19	4	(0.5)
How Much Is An Engineer Worth?	NT	1/27	4	(0.5)
NSPE Recommends Income, Benefit for Engineers	Lavoie	5/4	68	(8.0)
	NT	9/7	4	(1.0)

82, 83. New Product Development, Drafting & Reproduction

In 1972: 8% More Money For R&D	NT	1/13	4	(1.0)
Made In U.S.A. 2: America Fights Back	Zimmerman	3/9	84	(6.0)
Safety Dominates New Toy Designs	Aronson	3/23	32	(4.0)
When Is A Product Obsolete?	Levesque	4/20	170	(5.0)
Made In U.S.A. 3: Look Abroad for Bright Ideas	Aronson	5/4	76	(7.0)
U.S.A. 4: Design For Global Markets	Zimmerman	7/13	94	(8.5)
U.S.A. 5: Victory Through Brainpower	Khol	9/21	110	(12.0)
How To Fit In with the Product-Planning Committee	Bickford	11/16	120	(5.0)
Estimating Drafting Time: Art, Science, or Guesswork	Raimondi	9/7	94	(5.0)
The Instant Draftsman	Lavoie	4/6	68	(5.0)
Drafting Equipment: Manual Drafting	Chapter	EDE 11/23	3	(2.4)
Drafting Equipment: Automatic Drafting	Chapter	EDE 11/23	5	(1.3)
Laser Burns Its Message Into Metal-Coated Microfilm	NT	11/16	39	(1.0)
Reproduction Equipment: Copiers	Chapter	EDE 11/23	103	(1.4)
Reproduction Equipment: Duplicators	Chapter	EDE 11/23	104	(0.7)
Reproduction Equipment: Microfilm	Chapter	EDE 11/23	105	(2.4)

84. Laboratory & Testing

Rear-End 'Signature' Sought For Automotive Radar System	NT	2/10	32	(0.8)
Engineering Labs Can Be Fun	Chapter	4/6	30	(3.0)
DC-3 Helps Plan For Space Shuttle	NT	4/20	26	(0.6)
Troubleshooting with the SEM	Khol	5/18	142	(3.0)
Radar Not Ready For Car-Crash Sensing	NT	6/29	18	(0.5)
Sub 'Dives' 2,300 ft In Pressure Chamber	NT	7/13	6	(0.5)
Iceing Simulator	DI	7/27	34	(0.5)
The Fundamentals of Testing Hydraulic Products	Stockwell	7/27	78	(4.0)
An Ultrasonic Peek into Gray Iron	Scan	7/27	98	(0.7)
Italian Car Safety	Coppa-Zuccari	11/16	28	(2.0)
Skylab: The Real Test of Man in Space	Wise	11/16	32	(5.0)
Tester Accurately Simulates Fastener Loosening Forces	NT	11/30	10	(0.8)
Hydraulic Models: Solving Major Problems in Miniature	Aronson	11/30	20	(5.0)
Fundamental Measurement Equipment: Nondestructive Testing	Chapter	EDE 11/23	119	(1.0)
Fundamental Measurement Equipment: Property Tests	Chapter	EDE 11/23	166	(1.1)
Simulation Equipment: Vibration-Testing Machines	Chapter	EDE 11/23	166	(0.8)
Simulation Equipment: Shock-Testing Machines	Chapter	EDE 11/23	167	(0.3)
Federal Labs To Validate Performance of Inventions	NT	12/28	4	(0.5)
Robot Balloon: New Eye For The Military?	NT	12/28	6	(0.6)
Will Apollo Pay Off?	Bryson	12/28	20	(4.0)

85. Technical Information

Information Supermarkets	Lavoie	7/13	107	(5.0)
Start an Engineering Library and Leave the Digging to the Librarian	Pohs	4/20	186	(4.0)
Metrication Here Spurs Sales There (U.S.A. 4)	Boulden	7/13	102	(4.5)
Do-It-Yourself Editing	Petrolino	3/9	93	(2.0)
Writing a Technical Book—and getting paid for it!	D'Aprix	10/5	102	(5.0)

86, 87. Patents & Patent Law, Personal Professional

Lawyers Offer Engineers New Way to Moonlight	NT	11/30	4	(0.5)
3,754 Technical Employees Go Union	NT	1/27	4	(0.5)
The Engineer and Politics	Lavoie	2/24	66	(6.0)
The Candidates and Technology	Aronson	10/19	30	(5.0)
Look Who's Getting Involved	Lavoie	11/2	82	(7.0)
A Little Art Can Make You A Better Engineer	Ritter	3/9	90	(3.0)
LeMouse Racers Begin To Roll	Wise	4/20	30	(5.0)
LeMouse 5000 Champions	Article	7/13	8	(2.3)
Design Professionals Insurance Co. Expands Operations	NT	4/6	4	(0.5)
The Societies Search for Relevance	Lavoie	6/15	98	(7.0)

COMPLETE MACHINES

911. Ordnance

Helmet-Mounted Sights Ready For War.	NT	3/9	12	(0.5)
RPVs: The End of Manned Military Flight?	Aronson	4/20	20	(5.0)
Surface Control Ship: New Watchdog for Our Convoys	Article	6/1	26	(3.0)
SCAD: Proposed Help For Bombers	NT	6/1	30	(0.5)
What's New In U.S. Warplanes?	Article	7/13	28	(1.0)
Is the Battle Tank Dead?	Article	7/27	30	(2.0)
New Gun Designs for War and Peace	Article	11/2	30	(2.0)

912. Machinery

Oil-Lapping Catamaran	DI	1/13	40	(0.6)
Huge Parts Float On Air To Machining Stations	NT	1/27	8	(0.7)
Refuse Rollers	DI	4/20	48	(0.5)
Hooded Rail Car To Complete Pollution Of Coke Plants	NT	5/4	8	(0.5)
Corner-Turning Conveyor System Designed For Mines	NT	6/1	6	(0.5)
Ice Is the Enemy	Aronson	7/27	20	(6.0)
Wood Chips Practical for Landscaping Highways	NT	9/21	8	(0.5)
Module Is Ultraquiet and Supersafe	NT	9/21	37	(1.0)
Machine Tool '72	Khol	10/19	19	(8.0)

913. Electrical Machinery

Horn Blast Is Radiod to Car Ahead	NT	2/24	8	(0.5)
Radar Warns Motorist When He Is Tailgating	NT	6/29	6	(0.7)
Radar Not Ready For Car-Crash Sensing	NT	6/29	18	(0.5)
Experimental TV LP	DI	11/2	42	(0.7)

914. Transportation

Utilities Back Electric Cars	Wise	1/13	28	(5.0)
Bags, Belts, or Both	Wise	1/27	20	(6.0)
Ford Imports Jap Truck To Fight Toyota/Datsun Invasion	NT	2/10	10	(0.7)
Wagons Will Determine Minicar Sales Winner	NT	2/24	18	(1.0)
Sigma Gets It All Together	Morse	3/9	20	(2.0)
Lear's Steamer Heads for San Francisco	Article	3/9	24	(3.0)
Will STOL Take Off This Time?	Aronson	3/9	30	(4.0)
93 Teams Entered In Urban Car Contest	NT	3/23	18	(0.7)
NASA Calls For Jupiter-Saturn Mission 'Revolutionary' Indy-500 Car Designed, Tested in 5 Months	NT	4/6	10	(0.5)
Space Shuttle Landings To Be Simulated In Flight Tests	NT	4/6	18	(0.7)
Multimode Boat	DI	4/20	18	(0.5)
Quiet Snowmobile Sounds Like A Sports-car	NT	5/4	34	(0.6)
Aerospace Artists Show Two Ideas	NT	5/18	8	(0.6)
Transit Vehicles To Be Built From Modular Unit	NT	5/18	18	(1.0)
Indianapolis 1972: One, Two, Three, Parnelli?	Wise	5/18	20	(7.0)
Military Satellite	DI	5/18	47	(0.5)
Stronger Bumpers Needed By Small Cars	NT	6/1	10	(0.7)
Muscles for the Minicars	Aronson	6/1	20	(3.0)
Versatile Vehicle Designed For Developing Nations	NT	6/15	10	(0.8)

Transpo '72	Wise & Aronson	6/29	20	(6.0)
What's New In U.S. Warplanes?	Article	7/13	28	(1.0)
Ice Is the Enemy	Aronson	7/27	20	(6.0)
Icing Simulator	DI	7/27	34	(0.5)
The Now Generation Takes on Vehicle Pollution	Aronson	9/7	20	(6.0)
VW's New Top Model?	DI	9/7	30	(0.6)
1973s Are Here, Will There Be Any '75s?	Wise	9/21	20	(8.0)
BMW's 'Safe' Car	DI	10/5	42	(0.5)
BMW 520 Auto	DI	10/19	40	(0.5)
Italian Car Safety	Coppa-Zuccari	11/16	28	(2.0)
Foreign Car Review	DI	11/30	30	(2.0)
Viking: New 'Workhorse' Air Cushion Vehicle	NT	12/14	18	(0.5)
Rebirth of the Plastic Car?	Bryson	12/14	22	(5.0)
Britain's High-Speed Hovertrain	Morse	12/14	30	(4.0)
Prototype Amphibian	DI	12/14	38	(0.5)
Magnets Float Their First U.S. Vehicle	NT	12/28	26	(1.0)
Another Attempt to Revive the Blimp...	DI	12/28	32	(1.0)

915. Instruments

Quartz-Controlled Watches and Clocks	Article	1/27	30	(4.0)
The New-Generation Oscilloscopes	Donaldson	1/27	94	(5.0)
Keeping Tabs On Torque	Valentich	2/10	104	(4.0)
Students' Machine Puts Big Animals To Sleep	NT	2/24	31	(0.5)
Do You Really Understand Surface Texture?	Khol	4/6	86	(6.0)
Telescopes Get TV-Type Eyes	NT	5/18	31	(0.6)
New Point-and-Shoot Camera Designs	Article	5/18	34	(2.0)
Very High Speed Camera Records Metal Cutting	NT	5/18	36	(0.6)
Troubleshooting with the SEM	Khol	5/18	142	(3.0)
The Electronic Hospital	Bryson	11/16	20	(5.0)
Fundamental Measurement Equipment: Dimension	Chapter	EDE 11/23	116	(0.5)
Fundamental Measurement Equipment: Time	Chapter	EDE 11/23	116	(0.9)
Fundamental Measurement Equipment: Sound	Chapter	EDE 11/23	117	(1.1)
Fundamental Measurement Equipment: Light	Chapter	EDE 11/23	118	(1.1)
Mechanical Measurement Equipment: Stress and Strain	Chapter	EDE 11/23	130	(1.3)
Mechanical Measurement Equipment: Force	Chapter	EDE 11/23	131	(0.9)
Mechanical Measurement Equipment: Torque and Power	Chapter	EDE 11/23	132	(0.8)
Mechanical Measurement Equipment: Motion	Chapter	EDE 11/23	133	(1.8)
Temperature Measurement Equipment: Direct Measurement	Chapter	EDE 11/23	160	(1.9)
Temperature Measurement Equipment: Indirect Measurement	Chapter	EDE 11/23	162	(1.0)
Inside Polaroid's SX-70	Scan	12/14	150	(1.5)

Using the classification system provides nine major (one-digit) classifications, each of which has up to nine (two-digit) sub-classifications. These, in turn, are divided into ten (three-digit) indexing classifications.

Indexing classifications ending in 0 (General) are used to index material concerning several or all indexing classifications ending in 1 through 8. Classifications ending in 9 (Other) are used for material falling within the sub-classification but not within any of the items 1 through 8.

1—ELECTRICAL & ELECTRONIC

- 11 Motors**
- 110 General
- 111 Fractional (less than 1 hp)
- 112 Ac integral horsepower
- 113 Dc integral horsepower
- 114 Universal (dc and ac)
- 115 Multispeed
- 116 Gearmotors
- 117 Torque
- 118 Definite and special purpose
- 119 Other (linear)
- 12 Power Supplies**
- 120 General
- 121 Batteries (dry and wet)
- 122 Dc generators, motor-generators
- 123 Ac generators (alternators), motor-generators
- 124 Converters, inverters
- 125 Transformers
- 126 Fuel cells, solar cells, photo cells
- 127 Thermoelectric supplies
- 128
- 129 Other
- 13 Switches & Relays**
- 130 General
- 131 Mechanical (pushbutton, lever, rotary, mercury)
- 132 Thermally operated (thermostats)
- 133 Pressure operated
- 134 Limit (snap action)
- 135 Proximity, photoelectric
- 136 Stepping
- 137 Relays, circuit breakers
- 138 Motor starters (motor controls)
- 139 Other (reed)
- 14 Instruments & Controls**
- 140 General
- 141 Sensing devices (transducers, thermocouples)
- 142 Solenoids, electric actuators
- 143 Timers, timing motors, delays
- 144 Synchros
- 145 Instrument motors (synchronous)
- 146 Data recorders, readouts, indicators, displays
- 147 Meters, gages
- 148 Servo motors, stepping motors
- 149 Other
- 15 Circuit Components**
- 150 General
- 151 Resistors (rheostats, potentiometers)
- 152 Capacitors
- 153 Inductors
- 154 Solid-state devices (diodes, transistors, SCR's, rectifiers, semiconductor, integrated circuits)
- 155 Tubes
- 156 Saturable reactors (magnetic amplifiers)
- 157 Fuses
- 158 Lasers, masers
- 159 Other
- 16 Connectors & Wiring**
- 160 General
- 161 Rings, brushes, commutators
- 162 Terminals, binding posts
- 163 Contacts (buttons)
- 164 Plugs, receptacles, connectors, sockets
- 165 Wiring (cable, cord, coil, harness, bus bars)
- 166 Printed circuits, stitched circuits
- 167
- 168
- 169 Other (lenses, mirrors, reticles, prisms)
- 17 Miscellaneous Components**
- 170 General
- 171 Electromagnets, magnets
- 172 Chassis, control panels
- 173 Insulation, encapsulation, shielding
- 174 Cooling elements
- 175 Lamps, lighting elements (fiber optics)
- 176 Heaters, heating elements
- 177 Electric clutches & brakes
- 178
- 179 Other
- 19 Systems & Assemblies**
- 190 General
- 191 Amplifiers, preamps
- 192 Control systems (regulators, numerical control)
- 193 Electronic computers, calculators
- 194 Other electronic
- 195 Adjustable-speed drives
- 196 Servomechanisms
- 197 Other electromechanical
- 198 Packaging
- 199 Other

2—FLUID POWER

- 21 Fluids**
- 210 General
- 211 Hydraulic fluids
- 212 Coolants
- 213
- 214
- 215
- 216
- 217
- 218
- 219 Other
- 22 Fluid Conditioners**
- 220 General
- 221 Fluid storage (pressure vessels, reservoirs)
- 222 Filters, strainers, screens
- 223 Renovators
- 224 Heat exchangers
- 225 Coolers, radiators
- 226 Heaters
- 227 Driers
- 228
- 229 Other
- 23 Fluid Conductors**
- 230 General
- 231 Tubing (pressure)
- 232 Hose
- 233 Pipe
- 234 Fittings
- 235 Joints, couplings, unions
- 236 Mufflers
- 237
- 238
- 239 Other
- 24 Linear Devices**
- 240 General
- 241 Cylinders
- 242 Accumulators
- 243 Intensifiers
- 244 Actuators (bellows, diaphragms)
- 245 Pumps (linear)
- 246
- 247
- 248
- 249 Other
- 25 Rotary Devices**
- 250 General
- 251 Pumps (rotary)
- 252 Fluid motors
- 253 Air motors
- 254 Compressors
- 255 Rotary actuators
- 256
- 257
- 258
- 259 Other
- 26 Seals**
- 260 General
- 261 Materials seals (O-rings)
- 262 Mechanical seals
- 263 Gaskets
- 264 Wiper rings
- 265 Packings
- 266
- 267
- 268
- 269 Other
- 27 Valves**
- 270 General
- 271 Direction control
- 272 Flow control
- 273 Pressure control (relief)
- 274 Servo valves
- 275 Valve blocks (manifolds)
- 276 Nozzles
- 277
- 278
- 279 Other
- 28 Instruments & Controls**
- 280 General
- 281 Test stands
- 282 Control panels
- 283 Meters, gages
- 284 Switches
- 285 Transducers (to hydraulic)
- 286 Regulators
- 287 Fluid logic (fluidics)
- 288
- 289 Other
- 29 Systems & Assemblies**
- 290 General
- 291 Industrial hydraulic & pneumatic systems
- 292 Mobile, aircraft, marine
- 293 Hydrodynamic drives
- 294 Hydrostatic drives
- 295 Vacuum
- 296 Lubrication
- 297 Hydraulic, pneumatic computers
- 298
- 299 Other

3—MECHANICAL

- 31 Power Sources**
- 310 General
- 311 Jet engines
- 312 Internal-combustion engines
- 313 Turbines
- 314 Atomic, nuclear power
- 315 Exotic fuel engines (rockets)
- 316 Fuels, propellants, explosives
- 317 Steam
- 318
- 319 Other
- 32 Constant-Speed Drives & Transmissions**
- 320 General (speed reducers)
- 321 Chain
- 322 Belt
- 323 Friction (ball, disc, wheel, cone)
- 324 Gear
- 325
- 326
- 327
- 328
- 329 Other
- 33 Adjustable-Speed Drives & Transmissions**
- 330 General (speed reducers)
- 331 Chain
- 332 Belt
- 333 Friction (ball, disc, wheel, cone)
- 334 Gear
- 335
- 336
- 337
- 338
- 339 Other
- 34 Drive Components**
- 340 General
- 341 Transmission chain, cable
- 342 Belts, belting
- 343 Gears, gearing, racks
- 344 Sprockets
- 345 Pulleys, sheaves, idlers, tensioners
- 346 Conveyor chain, conveyor cable, conveyor belt
- 347 Conveyor screws
- 348
- 349 Other
- 35 Rotational Components**
- 350 General
- 351 Antifriction bearings (ball, roller, needle, linear, thrust)
- 352 Sleeve bearings (gas, solid-lubricant), bushings, rod ends
- 353 Flexible couplings, universal joints, flexible shafts
- 354 Torque converters, fluid couplings
- 355 Shafts, axles, splines, pinions, crankshafts, spindles
- 356 Clutches, brakes, power absorbers
- 357 Fans, blowers
- 358
- 359 Other
- 36 Mechanisms**
- 360 General
- 361 Cam
- 362 Linkages
- 363 Intermittent-motion (periodic-motion, indexing, mechanical timers)
- 364 Three-dimensional
- 365 Motion converters (leadscrews, jacks)
- 366 Spring motors
- 367
- 368
- 369 Other
- 37 Controls**
- 370 General
- 371 Push-pull
- 372 Transducers (to mechanical)
- 373 Gyros, gyroscopes
- 374 Counters
- 375
- 376
- 377
- 378
- 379 Other
- 39 Systems**
- 390 General

4—ASSEMBLY COMPONENTS

- 41 Fasteners**
- 410 General
- 411 Inserts
- 412 Nuts, lock nuts
- 413 Pins, dowels
- 414 Quick operating (panel-type, latches)
- 415 Retaining rings, keys, collars
- 416 Rivets
- 417 Screws, bolts, studs
- 418 Washers, grommets, eyelets, spacers
- 419 Other (spring clips, clamps, zippers)
- 42 Springs & Isolation Devices**
- 420 General
- 421 Fluid & air springs
- 422 Helical-wire springs
- 423 Leaf springs
- 424 Vibration isolators, mounts
- 425 Hydraulic-damping devices (shock absorbers, snubbers)
- 426 Mechanical-damping devices
- 427
- 428
- 429 Other (belleville)
- 43 Miscellaneous**
- 430 General
- 431 Locks
- 432 Nameplates, labels, wire markers
- 433 Dials, knobs, handles
- 434 Shims
- 435 Enclosures
- 436 Wheels, tires, rollers, casters
- 437 Slides, ways
- 438 Hinges, brackets
- 439 Other (razor blades, brushes, balls, buzzers)
- 49 General**
- 490 General

5—MATERIALS

- 51 Ferrous Metals**
- 510 General
- 511 Cast iron, malleable iron, cast carbon, alloy steels
- 512 Wrought carbon, alloy steels
- 513 Free-machining steels
- 514 Stainless steels, high alloys, high-temperature steels
- 515 Specialty steels (tool, die, electrical)
- 516
- 517
- 518
- 519 Other
- 52 Nonferrous Metals**
- 520 General
- 521 Aluminum
- 522 Copper, Brass, Bronze
- 523 Magnesium
- 524 Nickel
- 525 Titanium
- 526 Zinc
- 527 Refractory metals (tungsten, tantalum, molybdenum, columbium)
- 528 Precious metals
- 529 Other
- 53 Plastics**
- 530 General
- 531 Thermoplastic plastics (nylon, Teflon)
- 532 Thermosetting plastics (epoxy, phenolic, filled silicones, rigid urethanes)
- 533 Laminated plastics, vulcanized fiber
- 534 Reinforced, filled plastics
- 535
- 536
- 537
- 538
- 539 Other
- 54 Rubber & Elastomer**
- 540 General
- 541 Natural rubber
- 542 Synthetic rubber
- 543 Elastomeric plastics (flexible silicones & urethanes)
- 544 Hard rubber
- 545
- 546
- 547
- 548
- 549 Other
- 55 Joining Materials**
- 550 General
- 551 Adhesives, sealants, encapsulants
- 552 Welding rods
- 553 Brazing, soldering alloys
- 554
- 555
- 556
- 557

5—MATERIALS (continued)

- 558
- 559 Other
- 56 Other Nonmetals**
- 560 General
- 561 Carbon, graphite, diamonds
- 562 Glass, ceramics
- 563 Refractory materials, mica
- 564 Carbides, cermets
- 565 Mineral & synthetic fibers, felt
- 566 Insulating materials (thermal, sound)
- 567 Wood, cork, composition board, paper
- 568 Chemicals
- 569 Other (abrasives, friction materials)
- 57 Finishes, Coatings & Lubricants**
- 570 General
- 571 Metallic coatings
- 572 Chemical coatings, electrochemical coatings, photosensitive
- 573 Organic finishes (lacquers, synthetic enamels), paints, varnishes
- 574 Porcelain enamels, vitreous coatings
- 575 Plastic coatings
- 576 Lubricating materials
- 577 Cleaners, solvents
- 578
- 579 Other (corrosion inhibitors)
- 58 Prefabricated Forms**
- 580 General
- 581 Film, tape, sheet, foil
- 582 Wire, wire cloth, wire rope, cable
- 583 Patterned, perforated, expanded metals, textured, prefinished
- 584 Laminates (other than laminated plastics)
- 585 Composite materials
- 586 Structures (honeycomb, foam, sandwich)
- 587 Structural shapes (tubing, channels)
- 588 Balls
- 589 Other
- 59 General**
- 590 General

6—MANUFACTURING PROCESSES

- 61 Metal Casting**
- 610 General
- 611 Sand
- 612 Shell mold
- 613 Permanent mold
- 614 Centrifugal
- 615 Investment
- 616 Die
- 617
- 618
- 619 Other
- 62 Metal Shaping**
- 620 General
- 621 Forging
- 622 Extrusion, impact extrusion
- 623 Heading, upsetting, cold forming
- 624 Thread, form rolling
- 625 Powder metallurgy
- 626
- 627
- 628
- 629 Other
- 63 Metal Forming**
- 630 General
- 631 Sheet, plate forming
- 632 Stamping, drawing, blanking
- 633 High-velocity forming (explosive forming)
- 634 Spinning
- 635 Roll forming
- 636 Tube forming
- 637 Wire forming
- 638
- 639 Other
- 64 Metal Joining**
- 640 General
- 641 Arc welding
- 642 Gas welding
- 643 Resistance welding
- 644 High-energy welding (plasma, electron beam, explosive bonding)
- 645 Flame cutting
- 646 Brazing
- 647 Soldering
- 648 Adhesive joining, bonding
- 649 Other (interlocking, keylock, dovetail)
- 65 Metal Removal**
- 650 General
- 651 Planing, broaching
- 652 Lathe, screw machining
- 653 Milling, hobbing, gear shaping
- 654 Drilling, boring
- 655 Grinding, abrasive machining
- 656 Honing, lapping, polishing
- 657 High-energy machining (spark, laser)
- 658
- 659 Other
- 66 Metal Treating**
- 660 General
- 661 Heat treating
- 662 Surface treating (carburizing, nitriding)
- 663 Shot peening, surface working
- 664 Chemical milling, etching
- 665
- 666
- 667
- 668
- 669 Other
- 67 Finishing**
- 670 General
- 671 Chemical, solvent cleaning
- 672 Mechanical finishing
- 673 Conversion coating (anodizing) electro-polishing
- 674 Electroplating, vacuum metallizing
- 675 Metal spraying (flame spraying), hard facing
- 676 Painting
- 677
- 678
- 679 Other
- 68 Plastics & Rubber Processes**
- 680 General
- 681 Molding
- 682 Extrusion
- 683 Sheet forming
- 684 Laminating
- 685 Casting
- 686 Stamping, machining, fabricating, forming
- 687 Calendering, coating
- 688 Encapsulation
- 689 Other (filament winding)
- 69 General**
- 690 General (automatic assembly, sewing)

7—DESIGN THEORY & TECHNIQUES

- 71 Mechanics**
- 710 General
- 711 Statics (at rest)
- 712 Dynamics (force to create motion)
- 713 Kinematics (motion in abstract)
- 714 Vibration, natural frequency
- 715 Shock
- 716 Noise, sound, music
- 717
- 718
- 719 Other
- 72 Strength of Materials**
- 720 General
- 721 Elastic theory
- 722 Plastic theory
- 723 Fatigue, endurance
- 724 Creep
- 725 Impact stress
- 726 Thermal stress
- 727 Friction, wear
- 728 Fracture
- 729 Other
- 73 Strength of Parts**
- 730 General
- 731 Tension, compression
- 732 Bending
- 733 Shear, torsion
- 734 Surface contact stress
- 735 Plates
- 736 Cylinders, columns
- 737 Rotating discs
- 738
- 739 Other
- 74 Human-Factors Engineering**
- 740 General (life support)
- 741 Styling
- 742 Color
- 743 Safety
- 744 Illumination
- 745 Human limitations
- 746
- 747
- 748
- 749 Other

7—DESIGN THEORY & TECHNIQUES (continued)

- 75 Design Analysis & Synthesis**
- 750 General
- 751 Mathematical methods (statistics)
- 752 Graphical techniques
- 753 Analogs, models, simulators
- 754 Computer techniques
- 755 Reliability, quality control
- 756 Dimensioning (tolerances)
- 757
- 758
- 759 Other
- 76 Basic Sciences & Fields**
- 760 General
- 761 Physics
- 762 Chemistry
- 763 Thermal (cryogenics, heat transfer)
- 764 Radiation
- 765 Biosciences
- 766 Optics (photography, holography)
- 767 Ultrasonics
- 768
- 769 Other (economics)
- 77 Experimental Design**
- 770 General
- 771 Prototypes, breadboards
- 772 Testing (stress analysis)
- 773
- 774
- 775
- 776
- 777
- 778
- 779 Other
- 78 Environmental Design**
- 780 General
- 781 Corrosion, rust
- 782 Mold, fungus
- 783 Outer space
- 784 Under sea
- 785 Pollution
- 786
- 787
- 788
- 789 Other
- 79 General**
- 790 General

8—ENGINEERING MANAGEMENT & OPERATION

- 81 Engineering Department Operations**
- 810 General
- 811 Structure, organization
- 812 Costs, budgets
- 813 Programming, planning
- 814 Personnel policies
- 815 Recruiting, evaluation, training
- 816 Managerial talent
- 817 Compensation
- 818
- 819 Other
- 82 New Product Development**
- 820 General
- 83 Drafting & Reproduction**
- 830 General
- 831 Management, control systems
- 832 Drafting practices, techniques
- 833 Technical illustration
- 834 Drafting equipment
- 835 Reproduction equipment, systems (microfilm)
- 836 Furniture
- 837
- 838
- 839 Other
- 84 Laboratory & Testing**
- 840 General
- 85 Technical Information**
- 850 General
- 851 Engineering libraries, files, books
- 852 Information classification, retrieval
- 853 Specifications, standards
- 854 Report writing, articles, papers, oral
- 855 Part numbering
- 856 Engineering records
- 857
- 858
- 859 Other
- 86 Patents & Patent Law**
- 860 General
- 87 Personal & Professional**
- 870 General
- 871 Creativity, inventiveness
- 872 Meetings, shows
- 873 Other personal
- 874 Societies
- 875 Professional licensing
- 876 Unions
- 877
- 878
- 879 Other professional
- 88 Outside Services**
- 880 General
- 881 Engineering design services
- 882 Industrial design services
- 883
- 884
- 885
- 886
- 887
- 888
- 889 Other
- 89 General**
- 890 General

9—MISCELLANEOUS

- 91 Complete Machines**
- 910 General
- 911 Ordnance (tanks, missiles, rockets, ammunition, SIC 19)
- 912 Machinery (agricultural, construction, machine tools, office machinery, materials handling, SIC 35)
- 913 Electrical machinery (communications, radio radar, TV, appliances, X-ray, SIC 36)
- 914 Transportation (automotive, aircraft, ships, railroad, space craft, undersea craft, SIC 37)
- 915 Instruments (medical, dental, photographic, watches, SIC 38)
- 916 Fabricated metal products (hand tools, etc., SIC 34)
- 917
- 918
- 919 Other
- 99 Unclassified**
- 990 General (includes pages such as Editorials, "Back Talk," Covers, Contents Pages, etc.)

